

THE MINERAL INDUSTRY OF PORTUGAL

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Portugal, which is located in the Iberian Pyrite Belt (IPB), is one of the most mineralized areas of Western Europe. The area is geologically very complex, which tends to increase the diversity of the mineral resources in the country. The IPB, which stretches about 250 kilometers (km) from Seville, Spain, to the southwestern coast of Portugal, has an important mining history.

The mining sector contributed approximately 1% of the gross domestic product (GDP) and employed a similar fraction of the work force. The country has considerable mineral wealth; the deposits, however, are scattered and not easily exploited on a large scale. The most important metallic mineral resources were copper, tin, and tungsten. Industrial mineral resources include high-quality marble, pyrites, and rock salt. The pyrite reserves in the Alentejo region make up about 23% of total world reserves (Link2Exports, 2003¹).

Portugal has a land area of 92,390 square kilometers, which includes the Azores and the Madeira Islands, and is bordered on the east and north by Spain and on the south and west by the Atlantic Ocean. In 2003, the GDP based on purchasing power parity was \$183 billion, and per capita income based on purchasing power parity was \$14,460. The inflation rate was 3%, and the unemployment rate was more than 6% (International Monetary Fund, 2004§).

Although the mineral industry of Portugal was modest in size, the country was one of the leading producers of mined copper in the European Union (EU). The \$200 million Neves-Corvo Mine was the largest noncoal mining development project in Western Europe (U.S. Library of Congress, 2002§). The country was also an important producer of dimension stone and tungsten concentrates (table 1).

The Neves-Corvo Mine of Sociedade Mineira de Neves-Corvo S.A. (Somincor) and the Panasqueira Mine of Beralt Tin & Wolfram S.A. were the two major operations in the metals mining sector. Pirites Alentejanas S.A.R.L. was the country's largest producer of pyrite. Lusosider Aços Planos S.A. and SN Servicos S.A. were the major steel producers. Cimentos de Portugal S.A. (Cimpor) was an important producer of cement. With the exception of copper, dimension stone, tin, and tungsten, which were of international importance, production of other minerals and related materials had only domestic significance. Some of the large mineral-related companies were partially owned or controlled by the Government, and some operations were privately owned (table 2).

In response to EU directives, the Government continued with the country's privatization program and was proceeding with legislation that would privatize many state-owned companies. The privatization issue was part of a broader program to reduce the role of the state and to restructure the Portuguese economy to one that will be more market driven. The Government approved the sale of up to 18.3% of the share capital of Galp Energia S.A. for the third phase of the reprivatization of the company (Alexander's Gas & Oil Connections, 2003§).

Foreign trade comprised more than 50% of Portugal's GDP. Its value in 2003 was estimated to be \$80 billion. The EU accounted for almost 80% of Portugal's total trade.

EuroZinc Mining Corp. announced that it was purchasing the Neves-Corvo Mine from Somincor for \$156 million and would assume \$33.6 million in debt. EuroZinc was the only company to bid on the mine in January 2004. At the end of 2002, copper resources were reported to be 22.2 million metric tons (Mt) of measured resources with an average grade of 5.65% copper, 800,000 metric tons indicated resources with an average grade of 4.40% copper, and 7.6 Mt of inferred resources with an average grade of 4.03% copper (EuroZinc Mining Corp., 2004§).

Beralt Tin & Wolfram, which was owned by Primary Metals Inc. of Canada, operated the Panasqueira Mine in the Beira Baixa Province. The mine was one of the world's leading producers of tungsten concentrates outside of China and produced a 75% tungsten oxide (WO₃) concentrate. The deposit type was granitic and perigranitic veins and a stockwork of stringers or veinlets (thickness of less than 50 centimeters) discordant on the strata. The operation was underground and used a drift and fill mining method (Beralt Tin & Wolfram S.A., 2003§).

Avocet Mining plc and Primary Metals Inc. signed a memorandum of understanding whereby Primary Metals would take control of Avocet's tungsten assets, which included primarily the Panasqueira Mine. Avocet had stated its intention of becoming a focused gold mining company and has been seeking a satisfactory divestment of its remaining tungsten interests (Avocet Mining plc, 2003§).

EuroZinc announced that it had purchased controlling interest in Pirites Alentejanas S.A., which owned the Aljustrel lead and zinc mine. The Aljustrel Mine, which is located in the IPB, consisted of several mineral deposits and considerable infrastructure, which included a modern mill and underground workings. The mine was on a care-and-maintenance status, but EuroZinc completed a feasibility study for putting the mine back into production (EuroZinc Mining Corp., 2003§).

Portugal's industrial minerals sector was a modern and efficient producer of a variety of materials, most notably dimension stone and minerals for the manufacture of ceramics. The dimension stone industry continued to be an important segment of the mining industry in terms of value and trade.

¹References that include a section mark (§) are found in the Internet References Cited section

The capacity of the three integrated cement plants and one grinding station of Cimpor increased to 6.65 Mt from 4.45 Mt. Demand for cement was expected to continue. The development of Portugal's infrastructure was expected to create a substantial demand for cement in coming years (International Cement Review, 2003).

Marble was the most valuable of the stone products and accounted for the majority of stone production. The main area for marble mining continued to be the Evora District.

Although Portugal was one of the faster growing European economies, it had limited domestic energy resources and imported about 90% of its needs. Energy imports were expected to increase significantly because the country had little potential for increasing energy production. Portugal imported small amounts of coal for electricity generation. A commercially viable oil deposit has yet to be discovered in Portugal. The energy sector was expected to become increasingly more dependant and integrated with Spain's energy sector.

The country made a number of major infrastructure improvements, most notably a system of modern highways. Additional infrastructure projects included a new international airport at Lisbon, an upgrade of the country's rail system, a second phase of a natural gas pipeline system, and additional dams and port projects (U.S. Central Intelligence Agency, 2004§).

The structure of the mineral industry could change in the near future because of continuing mineral exploration based on exploration models developed in the IPB. Copper, gold, kaolin, lead, lithium, pyrites, and tin were some of the minerals targeted for exploration. The IPB is the prime area for exploration activity and would appear to have an above-average potential for success on the basis of an unusually high number of the large volcanogenic massive sulfide deposits discovered to date. There was potential for increased production of granite, marble, and slate.

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Major Sources of Information

Cabinete Para Pesquisa e Exploração de Petróleo-MIE

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TABLE 1
PORTUGAL: PRODUCTION OF MINERAL COMMODITIES^{1, *}

(Metric tons unless otherwise specified)

Commodity	1999	2000	2001	2002 ^c	2003 ^c
METALS					
Aluminum, secondary ^c thousand tons	18	18	18	16	18
Arsenic, white ^c	50	50	50	25	25
Beryl, concentrate, gross weight ^c	4	4	5	5	5
Copper, mine output, Cu content	99,459	76,200	82,965	77,227 ²	77,581 ²
Iron and steel:					
Iron ore and concentrate, manganiferous: ^c					
Gross weight	16,000	15,000	14,500	14,000	14,000
Fe content	11,733 ²	11,800	11,000	10,000	10,000
Metal:					
Pig iron thousand tons	389	382	82	100	100
Steel:					
Crude do.	1,038	1,097	728	894 ^{r, 2}	722 ²
Hot-rolled do.	853	910	865	1,054 ²	1,000
Lead, refined, secondary ^c	6,000	5,000	4,000	4,000	4,000
Manganese, Mn content of iron ore ^c	500	500	500	300	300
Silver, mine output, Ag content kilograms	26,450	20,430	23,100	19,500 ^{r, 2}	21,100 ²
Tin:					
Mine output, Sn content	2,163	1,227	1,174	574 ^{r, 2}	354 ²
Metal, primary and secondary	1,319 ^r	748 ^r	716 ^r	361 ^{r, 2}	218 ²
Tungsten mine output, W content	434	743	698	693 ²	715 ²
Uranium, U ₃ O ₈ content of concentrate	12	16	5	2 ^r	-- ²
Zinc, smelter, primary ^c	4,000	3,600	3,600	3,000	3,000
INDUSTRIAL MINERALS					
Cement, hydraulic thousand tons	10,147	10,343	10,000 ^c	10,000	10,000
Clays:					
Kaolin ³	221,296	162,674	146,436	148,706 ²	150,000
Refractory	521,602	712,951	660,775	614,453 ^{r, 2}	625,000
Diatomite	785 ^c	686	387	400	400
Feldspar	114,685	119,837	112,923	124,117 ²	126,116 ²
Gypsum and anhydrite	550,000 ^c	698,673	787,646	579,143 ^{r, 2}	580,000
Lime, hydrated and quicklime ^c	200,000	200,000	200,000	200,000 ^r	200,000
Lithium minerals, lepidolite	14,862	9,352	11,571	16,325 ²	16,000
Nitrogen, N content of ammonia	223,200	246,000	201,600	190,300 ²	244,700 ²
Pyrite and pyrrhotite, including cuprous, gross weight ^c	10,000	10,000	10,000	10,000	10,000
Salt, rock	558,807	584,516	625,785	603,959 ²	602,035 ²
Sand thousand tons	3,664	8,311	10,000	10,953 ²	10,000
Sodium compounds, n.e.s.: ^c					
Soda ash	150,000	150,000	150,000	150,000	150,000
Sulfate	50,000	50,000	50,000	50,000	50,000
Stone:					
Basalt ^c	520,262 ²	500,000	500,000	50,000	50,000
Calcareous:					
Dolomite ^c thousand tons	1,600 ^r	1,600 ^r	1,700 ^r	1,758 ^{r, 2}	1,800
Limestone, marl, calcite do.	35,580	45,785	37,654	51,095 ^{r, 2}	50,000
Marble do.	1,215	933	835	802 ^{r, 2}	800
Gabbro ^c do.	100	100	100	100	100
Granite:					
Crushed do.	22,400	20,000 ^c	29,246	28,645 ^{r, 2}	30,000
Ornamental do.	458	464	909	900	900
Graywacke ^c do.	20	20	1,073 ²	1,000	1,000
Ophite do.	3 ^c	178	149	120 ^r	120
Quartz ^c do.	15	38 ²	20	16 ²	16 ²
Quartzite do.	573	600	1,036	455 ^{r, 2}	500

See footnotes at end of table.

TABLE 1--Continued
PORTUGAL: PRODUCTION OF MINERAL COMMODITIES^{1, *}

(Metric tons unless otherwise specified)

Commodity	1999	2000	2001	2002 ^c	2003 ^c
INDUSTRIAL MINERALS--Continued					
Stone--Continued:					
Schist thousand tons	136	149	140 ^c	150	150
Slate ^c do.	46 ²	40	40	40	40
Syenite do.	80 ^c	127	256	185 ^{r, 2}	200
Sulfur, byproduct, all sources ^c	32,000	30,000	28,000	28,000	2,700
Talc	9,554	7,407	8,362	8,916 ²	5,459 ²
MINERAL FUELS AND RELATED PRODUCTS					
Coke, metallurgical ^c thousand tons	325	325	300	300	300
Gas, manufactured ^c thousand cubic meters	125	125	125	125	125
Petroleum refinery products:					
Liquefied petroleum gas thousand 42-gallon barrels	3,874	3,132	3,200 ^c	3,200	3,200
Gasoline do.	22,679	20,213	20,000 ^c	20,000	20,000
Kerosene and jet fuel do.	7,680	6,216	6,500 ^c	6,500	6,500
Distillate fuel oil do.	31,727	29,131	30,000 ^c	30,000	30,000
Residual fuel oil do.	18,968	18,828	19,000 ^c	19,000	19,000
Unspecified do.	17,018	15,067	16,000 ^c	16,000	16,000
Refinery fuel and losses do.	4,031	3,618	3,800 ^c	3,800	3,800
Total do.	105,977	96,205	98,500 ^c	98,500	98,500

^cEstimated; estimated data are rounded to no more than three significant digits; may not add to totals shown. -- Zero.

¹Table includes data available through May 2004.

²Reported figure.

³Includes washed and unwashed kaolin.

*Revised on October 20, 2005.

TABLE 2
PORTUGAL: STRUCTURE OF THE MINERAL INDUSTRY IN 2003

(Thousand metric tons unless otherwise specified)

Commodity		Major operating companies and major equity owners	Location of main facilities	Annual capacity
Cement		Cimentos de Portugal S.A. (Cimpor) (Government, 10%)	Plants (3) at Alhandra, Loulé, and Souselas	5,450
Copper concentrate		EuroZinc Mining Corp.	Neves-Corvo Mine near Castro Verde	500
Diatomite		Sociedade Anglo-Portuguesa de Diatomite Lda.	Mines at Obidos and Rolica	5
Feldspar		A.J. da Fonseca Lda.	Seixigal Quarry, Chaves	10
Ferroalloys		Electrometalúrgia S.A.R.L.	Plant at Setubal	100
Petroleum, refined	barrels per day	Petroleos de Portugal (Government, 100%)	Refineries at Lisbon, Porto, and Sines	300,000
Pyrite		Pirites Alentejanas S.A. (EuroZinc Mining Corp.)	Mine at Aljustrel, plant at Setubal	100
Steel, crude		SN Servicos S.A. (Corus Group, 50%, and Usinor Group, 50%)	Steelworks at Seixal	550
Do.		Lusosider Aços Planos S.A.	do.	500
Tin		EuroZinc Mining Corp.	Neves-Corvo Mine near Castro Verde	15
Tungsten concentrate	tons	Beralt Tin & Wolfram S.A. (Primary Metals Inc.)	Panasqueira Mine and plant at Barroca	1,400
Uranium	do.	Empresa Nacional de Uranio S.A. (Government, 100%)	Mines at Guargia, plant at Urgeirica	150
Zinc, refined		RMC Quimigal S.A.R.L.	Electrolytic plant at Barreiro	12